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THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
600 GALLERIA PARKWAY, S.E.
STE 1500
ATLANTA, GA 30339-5994

EXAMINER	
SCHMIDT, KARL	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/811,115
Filing Date: March 26, 2004
Appellant(s): HO ET AL.

Daniel R. McClure
Reg. No. 38,962
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10 September 2009 appealing from the Office action mailed 27 October 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Zhu et al. "Image Coding by Folding" IEEE, 1997, pp. 665-668.

20040120517	**Inomata et al.**	**6-2004**
6,917,384	**Fukushima**	**7-2005**

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 8-10, 11-13 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. "Image Coding By Folding" in view of Inomata et al. (US 2004/0120517 A1).

Claims 1 and 11

Zhu discloses comprising: a first image device; comprising: a compression unit to divide an original image into two image parts according to a compression technique (see at least, abstract: the examiner notes a coding/compression algorithm) wherein a first image part of the image parts is base image data and a second image part of the image part is auxiliary image data image (see at least, abstract: the examiner notes an image is split into a host image and a residual image), and the base image data and the base image data and the auxiliary image data respectively comprise a part of image contents comprising pixel values of the original image (see at least, section 4 "Experimental Results": the examiner notes the image size in pixels) and compress the base image data to compressed base image data according to the compression technique (see at least, abstract: the examiner notes the use of a standard compression technique to compress the host); and an image composing unit coupled to the compression unit to receive and compose the compressed base image data and the auxiliary image data bit stream into a image corresponding to the original image (see at least, introduction: the examiner notes the host image, which is compressed, and residual image, which is compressed into a bit stream, is embedded into the host image).

Zhu fails to disclose an image protection system comprising an encryption unit coupled to the compression unit to receive and encrypt the auxiliary image data to an auxiliary image data cipher; and an image composing unit that combines the image parts to compose a plaintext for the first image part and cipher for the second image part are in the protected image.

However, Inomata discloses an image protection system (see at least, abstract) comprising an image divider that divides an image into two parts (see at least, [0025]: the examiner notes an image divider to divide the original data) into an image to be compressed (see at least, [0025]) and using an encryption unit coupled to the image divider (see at least, FIG. 1) to receive and encrypt the auxiliary image data to an auxiliary image data cipher (see at least, [0033]-[0034]: the examiner notes encrypt is carried on out the code table representing the quantization values of the image) and an image composing unit that combines the image parts to compose a plaintext for the first image part and cipher for the second image part are in the protected image (see at least, [0035]: the examiner notes the multiplexer joins compressed data output and the encrypted data) .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zhu's compression image device that divides an original image to include an image protection system, comprising an image divider that divides an image into two parts into an image to be compressed and using an encryption unit coupled to the image divider to receive and encrypt the auxiliary image data to an auxiliary image data cipher and an image composing unit that combines the image parts to compose a plaintext for the first image part and cipher for the second image part are in the protected image as taught by Inomata to add the functionality of image protection and encryption. One of ordinary skill in the art would have been motivated to combine the teachings in order to avoid the risk of image data

disclosure due to interception on the internet or as a result of being viewed by unauthorized persons (see at least, Inomata, [0005]).

Claims 2 and 12

Zhu fails to disclose further comprising: a second image device, comprising: an image decomposition unit to receive and decompose the protected image into the compressed base image data and the auxiliary image data cipher; a decryption unit coupled to the image decomposition unit to receive and decrypt the auxiliary image data cipher to the auxiliary image data using a decryption key; and a decompression unit coupled to the image decomposition unit and the decryption unit to receive the compressed base image data and the auxiliary image data, decompress the compressed base image data to the base image data, and combine the base image data and the auxiliary image data to recover the original image according to the compression technique.

However, Inomata discloses further comprising a second image device, comprising (see at least, [0041]: the examiner notes a decompression/decryption device): an image decomposition unit to receive and decompose the protected image into the compressed base image data and the auxiliary image data cipher (see at least, [0041]: the examiner notes a demultiplexer separates input multiplexed data in order to interpret and decode the result into an image (e.g. [0045])); a decryption unit coupled to the image decomposition unit to receive and decrypt the auxiliary image data cipher to the auxiliary image data using a decryption key (see at least, [0042]: the examiner notes a decryptor decodes extracted encrypted data and restores the correct quantization

table); and a decompression unit coupled to the image decomposition unit and the decryption unit to receive the compressed base image data and the auxiliary image data (see at least, [0041]-[0045]), decompress the compressed base image data to the base image data (see at least, [0043]: the examiner notes an entropy decoder decodes the compressed data one at a time), and combine the base image data and the auxiliary image data to recover the original image according to the compression technique (see at least, [0045]: the examiner notes an image reconstructor reproduces the original image from the decompression/decryption process).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zhu to include a second image device, comprising: an image decomposition unit to receive and decompose the protected image into the compressed base image data and the auxiliary image data cipher; a decryption unit coupled to the image decomposition unit to receive and decrypt the auxiliary image data cipher to the auxiliary image data using a decryption key; and a decompression unit coupled to the image decomposition unit and the decryption unit to receive the compressed base image data and the auxiliary image data, decompress the compressed base image data to the base image data, and combine the base image data and the auxiliary image data to recover the original image according to the compression technique as taught by Inomata. One of ordinary skill in the art would have been motivated to combine the teachings in order to avoid the risk of image data disclosure due to interception on the internet or as a result of being viewed by unauthorized persons (see at least, Inomata, [0005]).

Claims 3 and 13

Zhu fails to disclose wherein the first image device further comprises a transformation unit to perform discrete wavelet transformation on the original image in advance.

However, Inomata discloses wherein the first image device further comprises a transformation unit to perform discrete wavelet transformation on the original image in advance (see at least, [0025]: the examiner notes the use DCT (discrete cosine transformation) and wavelet transformation as an orthogonal transformation process).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zhu to include wherein the first image device further comprises a transformation unit to perform discrete wavelet transformation on the original image in advance as taught by Inomata. One of ordinary skill in the art would have been motivated to combine the teachings in order to avoid the risk of image data disclosure due to interception on the internet or as a result of being viewed by unauthorized persons (see at least, Inomata, [0005]).

Claims 8 and 18

Zhu discloses wherein the compression technique is resolution compression (see at least, introduction: the examiner notes the host image is 50% of the size of the original).

Claims 9 and 19

Zhu discloses wherein the compression technique is quality compression (see at least, introduction: the examiner notes the host image is 50% of the size of the original and still have perfect reconstruction).

Claims 10 and 20

Zhu discloses wherein the compression unit further compresses the auxiliary image data (see at least, abstract: the examiner notes the residual image in compressed into a bit stream).

Claims 4-7 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. "Image Coding By Folding" in view of Inomata et al. (US 2004/0120517 A1).as applied to claim 1 and 3 above, and further in view of Fukushima (US 6,917,384 B1).

Claims 4 and 14

Zhu in view of Inomata fails to disclose wherein the second image device further comprises an anti-transformation unit to perform anti-discrete wavelet transformation on the original image after the original image is combined.

However, Fukushima discloses wherein the second image device further comprises an anti-transformation unit to perform anti-discrete wavelet transformation on

the original image after the original image is combined (see at least, col. 10, lines 20-39: the examiner notes an inverse discrete wavelet transformation).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zhu in view of Inomata to include wherein the second image device further comprises an anti-transformation unit to perform anti-discrete wavelet transformation on the original image after the original image is combined as taught by Fukushima. One of ordinary skill in the art would have been motivated to combine the teachings in order to automatically set an appropriate region of an image in order to perform coding (see at least, Fukushima, see at least, col. 1, lines 57-62).

Claims 5 and 15

Zhu in view of Inomata fails to disclose wherein the first image device further comprises a quantization unit to quantize each coefficient of the original image after the discrete wavelet transformation.

However, Fukushima discloses wherein the first image device further comprises a quantization unit to quantize each coefficient of the original image after the discrete wavelet transformation (see at least, col. 8, lines 24-27: the examiner notes a quantization step that quantizes each coefficient and col. 10, lines 20-39: the examiner notes an inverse discrete wavelet transformation).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zhu in view of Inomata to include

wherein the first image device further comprises a quantization unit to quantize each coefficient of the original image after the discrete wavelet transformation as taught by Fukushima. One of ordinary skill in the art would have been motivated to combine the teachings in order to automatically set an appropriate region of an image in order to perform coding (see at least, Fukushima, see at least, col. 1, lines 57-62).

Claims 6 and 16

Zhu in view of Inomata fails wherein the second image device further comprises an anti-quantization unit to anti-quantize each coefficient of the original image before the anti-discrete wavelet transformation.

However, Fukushima wherein the second image device further comprises an anti-quantization unit to anti-quantize each coefficient of the original image before the anti-discrete wavelet transformation (see at least, col. 9, lines 49-57: the examiner notes an inverse quantization unit and col. 10, lines 20-39: the examiner notes an inverse discrete wavelet transformation).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zhu in view of Inomata to include wherein the second image device further comprises an anti-quantization unit to anti-quantize each coefficient of the original image before the anti-discrete wavelet transformation as taught by Fukushima. One of ordinary skill in the art would have been motivated to combine the teachings in order to automatically set an appropriate region

of an image in order to perform coding (see at least, Fukushima, see at least, col. 1, lines 57-62).

Claims 7 and 17

Zhu in view of Inomata fails to disclose wherein the compression technique is region of interest (ROI) compression.

However, Fukushima discloses wherein the compression technique is region of interest (ROI) compression (see at least, abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zhu in view of Inomata to include wherein the compression technique is region of interest (ROI) compression as taught by Fukushima. One of ordinary skill in the art would have been motivated to combine the teachings in order to automatically set an appropriate region of an image in order to perform coding (see at least, Fukushima, see at least, col. 1, lines 57-62).

(10) Response to Argument

Claims 1-3, 8-10, 11-13, and 18-20 are rejected under 35 U.S.C 103(a) as being unpatentable over Zhu in view of Inomata

The applicant argues that the rejection of Zhu in view of Inomata should be overturned by arguing that Zhu in view of Inomata are patently defined over the prior art, i.e. (emphasis added and further Claim 1 is similar to Claim 11):

1. An image protection system, comprising:

a first image device, comprising:

a compression unit to ***divide an original image into two image parts according to a compression technique***, wherein a first image part of the image parts is base image data and a second image part of the image parts is auxiliary image data, and the base image data and the ***auxiliary image data respectively comprise a part of image contents comprising pixel values of the original image, and compress the base image data to compressed base image data according to the compression technique***;

an encryption unit coupled to the compression unit to receive and ***encrypt the auxiliary image data to an auxiliary image data cipher***; and

an image composing unit coupled to the compression unit and the encryption unit to receive and compose the compressed base image data and the auxiliary image data cipher into a protected image corresponding to the original image, ***such that plaintext for the first image part and cipher for the second image part are in the protected image***.

The examiner respectively disagrees.

The examiner notes Zhu does indeed disclose a compression unit to ***divide an original image into two image parts according to a compression technique*** ... ***auxiliary image data respectively comprise a part of image contents comprising pixel values of the original image, and compress the base image data to compressed base image data according to the compression technique*** (emphasis added). (see Appellants Argument, pp. 5-7). The examiner notes Zhu discloses "image coding by folding" (e.g. interpreted to be a compression technique) that folds an image into itself (see abstract). Zhu discloses that he image is split into two parts a host image (e.g. base image) and a residual image (e.g. auxiliary image) (see abstract). The examiner further notes Zhu discloses that the first image is a subsampled image along one direction and the residual image is the difference between the remaining subimage and the host subimage (see at least, Introduction, paragraph 3). The examiner notes these two images therefore comprise image contents based on pixel values from the original image. The examiner further notes Zhu teaches the host image (e.g. base image) is compressed based to a compression technique which is the "image coding by folding" in which it is now 50% the size of the original image (see at least, abstract). Therefore as noted Zhu does indeed teach the applicant's claimed invention.

The examiner further notes Inomata discloses ...***encrypt the auxiliary image data to an auxiliary image data cipher*** (emphasis added). (see Appellants Argument, pp. 7-9). The examiner notes Inomata discloses that an image divider can divide the original data to be compressed (e.g. an image) (see [0025]). The examiner further

notes Inomata discloses that the block units are made of pixel data which are based on the divided original data (e.g. n pixels x n pixels) (see [0025]) which are noted to be frequency components. Inomata discloses that these components are input into a quantize that quantizes values of the components. Inomata further discloses the nxn quantization data is input into an entropy encoder (see at least, [0029]) for further processing. From here Inomata discloses that encryption processing is performed in parallel with respect to the quantization and entropy encoding, therefore the nxn quantization data is encrypted. This is the interpreted to be the cipher of the original image data as it relates to the nxn pixels. Therefore as noted Inomata does indeed teach the applicant's claimed invention.

The examiner further notes Inomata discloses ***such that plaintext for the first image part and cipher for the second image part are in the protected image*** (emphasis added) (see Appellants Arguments, page 9-10). The examiner notes Inomata discloses that image data such as overall number of pixels of the image data, number of pixels on one line, block size, data precision, number of components, etc are included in the parameters (e.g. forms of plain text) that are included in the compressed data representation (see at least, [0035]). The examiner notes the quantization and entropy process form the cipher part of the image and along with the parameters are joined into a compressed output (which would be the protected image). Therefore as noted Inomata does indeed teach the applicant's claimed invention.

Further the Appellant argues the motivation to combine the references (see Appellant's Arguments, pp 10-13). The examiner disagrees. The examiner notes

motivation was provided for the combination and both references as they are within the same scope. Further one of ordinary skill in the art would have had the knowledge to combine the references in order to obtain a predictable result. Therefore the examiner finds all these arguments presented not persuasive.

Claims 4-7 and 14-17 are rejected under 35 U.S.C 103(a) as being unpatentable over Zhu in view of Inomata, and further in view of Fukushima

The Appellant argues that the cited references fail to disclose the limitation of claim 4, by stating there is no mention whatsoever of "wavelet" or a anti-discrete wavelet. The examiner disagrees and notes Fukushima discloses an "inverse discrete wavelet transformation" (see col. 10, lines 20-21). Therefore there is a mention of "wavelet" and further this an "inverse discrete wavelet transformation" in interpreted to work on an inverse discrete wavelet which would be interpreted to be an anti-discrete wavelet.

Further the Appellant argues the motivation to combine the references. The examiner disagrees. The examiner notes motivation was provided for the combination of references as they are within the same scope. Further one of ordinary skill in the art would have had the knowledge to combine the references in order to obtain a predictable result. Therefore the examiner finds all these arguments presented not persuasive.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Kari L Schmidt

/Kari L Schmidt/
Examiner, Art Unit 2439

Conferees:

/Edan Orgad/

Supervisory Patent Examiner, Art Unit 2439

/Christian LaForgia/

Primary Examiner, Art Unit 2439